

Notice of Allowability

Application No.

10/537,437

Examiner

Eric S. Olson

Applicant(s)

HARA ET AL.

Art Unit

1623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Applicant's communication submitted October 2, 2007.
2. ☒ The allowed claim(s) is/are 1-5, 7, 8, 13, 14, 21 and 25.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

Detailed Action

This office action is a response to applicant's communication submitted October 2, 2007, wherein claims 1, 4, and 5 are amended. This application is a national stage application of PCT/JP03/15336, filed December 1, 2003, which claims priority to foreign applications JP2002-352968, filed December 4, 2002, and JP2002-358249, filed December 10, 2002.

Claims 1-8, 13, 14, 21, 24, and 25 are pending in this application.

Claims 1-8, 13, 14, 21, 24, and 25 as amended are examined on the merits herein.

The terminal disclaimer filed on October 2, 2007, disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of US patent 7019173, has been reviewed and is accepted. The terminal disclaimer has been recorded.

Applicant's amendment, submitted October 2, 2007, with respect to the rejection of instant claim 4 under 35 USC 112, second paragraph, for omitting the identity of general formula I, has been fully considered and found to be persuasive to remove the rejection as the claim has been amended to provide a clear, definite chemical structure for general formula I. Therefore the rejection is withdrawn.

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Applicant's amendment, submitted October 2, 2007, with respect to the rejection of instant claims 1, 3, and 25 under 35 USC 103(a), for being obvious over Dmowski et al., has been fully considered and found to be persuasive to remove the rejection as the claims have been amended to recite only reactants that are not taught or fairly suggested by Dmowski et al. Therefore the rejection is withdrawn.

Applicant's terminal disclaimer, submitted October 2, 2007, with respect to the rejection of instant claims 1-3 under the doctrine of obviousness-type double patenting, for claiming the same invention as claims 1-3 and 5-6 of US patent 7019173, has been fully considered and found to be persuasive to remove the rejection. Therefore the rejection is withdrawn.

The reasons for allowance will be discussed below.

The reasons for allowance and Examiner's amendment are as follows:

Examiner's Amendment

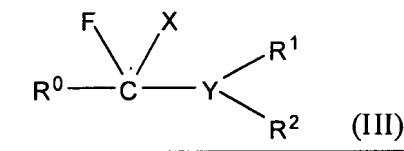
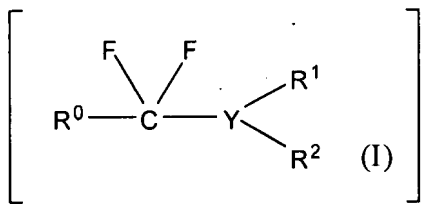
An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with William Solomon on October 26, 2007.

Claim 4 is amended as follows:

4. (Currently amended) A method of fluorination which comprises fluorinating a monosaccharide or monosaccharide bonded to a base of a nucleic acid by bringing the monosaccharide or monosaccharide bonded to a base of a nucleic acid and a fluorinating agent represented by the general formula [(I)] (II):

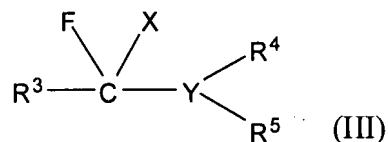


wherein Y represents nitrogen atom or phosphorus atom, X represents hydrogen or halogen atom, R^0 , R^1 and R^2 represent hydrogen atom or an alkyl or aryl group which may have substituents, the atom and the groups represented by R^0 , R^1 and R^2 may be a same with or different from each other, and two or three of the groups represented by R^0 , R^1 and R^2 may be bonded to each other to form a ring into reaction with each other under irradiation with at least one of microwave and electromagnetic wave having a wavelength around a microwave region.

Claim 6 is cancelled.

Claim 7 is amended as follows:

7. (Currently Amended) A method of fluorination according to Claim [6] 4, wherein the fluorinating agent is a compound represented by general formula (III):



wherein R^3 , R^4 and R^5 each independently represent an alkyl or aryl group which may have substituents, X represents hydrogen atom or a halogen atom, and two or three of the groups represented by R^3 , R^4 and R^5 may be bonded to each other to form a cyclic structure.

Claim 13 is amended as follows:

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13. (Currently Amended) A method of fluorination according to Claim [6] 4, wherein the fluorinating agent is a compound represented by general formula (II) in which X represents fluorine atom.

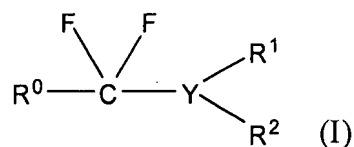
Claim 14 is amended as follows:

14. (Currently Amended) A method of fluorination according to Claim [6] 4, wherein the fluorinating agent is a compound represented by general formula (II) in which X represents fluorine atom, Y represents nitrogen atom, R° represents 3-methylphenyl group or 2-methoxyphenyl group, and R1 and R2 represent ethyl group.

Claim 24 is cancelled.

The abstract is amended as follows:

A method of fluorination comprising reacting monosaccharides, oligosaccharides, polysaccharides, composite saccharides formed by bonding of these saccharides with proteins and lipids and saccharides having polyalcohols, aldehydes, ketones and acids of the polyalcohols, and derivatives and condensates of these compounds with a fluorinating agent represented by general formula (I) thermally or under irradiation with microwave or an electromagnetic wave having a wavelength around the microwave region. In accordance with the method, the fluorination at a selected position can be conducted safely at a temperature in the range of 150 to 200°C where the reaction is difficult in accordance with conventional methods. The above method comprising the irradiation with microwave or an electromagnetic wave having a wavelength around the microwave region can be applied to substrates other than saccharides. ~~When a complex compound comprising HF and a base is reacted under irradiation with microwave, fluorination at a specific position which is difficult in accordance with conventional methods proceeds highly selectively, efficiently in a short time and safely.~~



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The following paragraph is added to the beginning of the specification:

This application is a national stage application of PCT/JP03/15336, filed December 1, 2003, which claims priority to foreign applications JP2002-352968, filed December 4, 2002, and JP2002-358249, filed December 10, 2002.

Reasons for Allowance

Claims 1-5, 7, 8, 13, 14, 21, and 25; as amended by the previously mentioned examiner's amendment, are currently pending and are seen to be allowable over the prior art.

The reasons for allowance are as follows. The claimed subject matter is seen to be adequately described and enabled by Applicant's specification. For example, pp. 9-14 of the specification provide adequate written description of the claimed invention. Furthermore, the working examples on pp. 28-42 enable the fluorination of various sugars. Although the use of protecting groups is required for the fluorination of these sugars, protecting the hydroxyl groups of sugars is extremely well known in the art and can be practiced by anyone skilled in the art.

Furthermore, the claimed invention is seen to be novel and non-obvious over the prior art. The closest prior art, Dmowski et al., (Reference of record in previous action) teaches fluorination with the fluorinating agent difluorobenzyl dimethylamine, or DBDA, but does not disclose the phenyl-substituted fluorinating agents of instant claims 1-3. It would not have been obvious to substitute the phenyl ring of DBDA with any of the substituents recited in instant claim 1 based on Dmowski et al. or any other prior art, because any substituent on this phenyl ring will exert electron donating or withdrawing effects that will influence the characteristics of the C-F bond and thus the reactivity of the compound. This effect would not be predictable to one of ordinary skill in the art, and thus there would be no reasonable expectation that these substituted compounds would display improved fluorinating activity. Although the additional reference Dmowski

et al. '82 (Reference included with PTO-892) discloses compounds having the recited substituents, (for example table 1 on p. 1372) this reference only discloses methods for making these compounds and is silent as to their reactivity or utility as fluorinating agents. Therefore claims 1-3 are patentable over the prior art.

In addition, claims 4, 5, 7, 8, 13, 14, 21, and 25 are novel and non-obvious over the prior art because neither Dmowski et al. nor any other prior art discloses a fluorination reaction involving the claimed fluorinating agents such as DBDA carried out under microwave irradiation. Furthermore, it is not obvious to one of ordinary skill in the art to add microwave irradiation to this fluorination. Nothing in the prior art would fairly suggest that doing so would improve the yield, rate, selectivity, or any other characteristic of the reaction.

Although the instant claims claim the same subject matter as that claimed in US patent 7019173, a terminal disclaimer has been filed in the present application disclaiming the terminal portion of any patent granted in said application that extends beyond the expiration of US patent 7019173.

For these reasons, the claimed subject matter is seen to be patentable over the prior art.

Accordingly, Applicant's amendment submitted October 2, 2007, and the accompanying examiner's amendment, are sufficient to remove all rejections made in the prior office action as discussed above and to place the application in condition for allowance.

Any comments considered necessary by Applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled, "Comments on Statement of Reasons for Allowance."

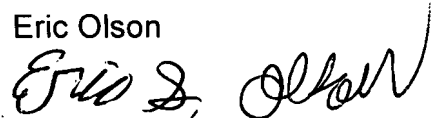
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric S. Olson whose telephone number is 571-272-9051. The examiner can normally be reached on Monday-Friday, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shaojia Anna Jiang can be reached on (571)272-0627. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Eric Olson



Patent Examiner

AU 1623

10/28/07

Anna Jiang



Supervisory Patent Examiner

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